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A Proposed Reconciliation of Stakeholder Interests in the GE Soybean Industry and Role of Earth Jurisprudence Principles

Kristen N. King Jaiven

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Kristen N. King Jaiven, Esq.[A]

[A] Kristen N. King Jaiven, Esq. is the Director of Communications and Development for Farm Share, Inc., a non-profit focused on food recovery and distribution to Florida families in need. Before going to work for a non-profit, Kristen worked as in-house counsel for American Tower Corporation, focusing on commercial real estate. During law school, Kristen clerked for the South Florida Water Management District, focusing on environmental enforcement matters. Kristen N. King Jaiven, Esq. holds a B.S. in Legal Studies with a minor in Criminal Justice from the University of Central Florida and a J.D., *cum laude,* with a Certificate in Environmental Justice from St. Thomas University School of Law. Kristen is a candidate for her LL.M. in Environmental Law with a certificate in Food and Agriculture Policy from Vermont Law School.

INTRODUCTION

The historical art of seed saving ensured farmers would have enough quality seeds for the following season. Traditional and indigenous farmers mastered seed saving techniques, saving the healthiest and strongest seeds to ensure preservation of seed diversity and adequate crop yields.[1] Moe Parr is an Indiana seed cleaner in his seventies who, for decades, made a career of cleaning seeds for the purpose of seed saving. Using a machine created in the 1800s, Parr travels to small farms to clean seeds. Parr's clients consist of a group of farmers with which he has become close friends over the years.[2]

In 2002, Parr received a letter from the Monsanto Company explaining that it holds patents to herbicide resistant genetic traits contained within various crop seeds, including the Roundup® ready soybean, and that using such seeds requires signing a license agreement with Monsanto.[3] The express terms of this license agreement prohibit saving seeds for the purpose of future planting.[4] The letter accused Parr of committing patent infringement by cleaning patented seeds for the only purpose of seed saving and by orally advising clients that they were entitled to plant saved seeds.[5] After years of legal battles that forced Parr's clients and friends to testify against Parr's interest, and the accumulation of extensive legal fees, the United States District Court for the Northern District of Indiana ordered a permanent injunction against Parr.[6] As a result, Parr cannot clean any seed that contains patented traits. In addition, Parr must now advise

1. ELI ROGOSA KAUFMAN, FROM GENERATION TO GENERATION, AN ACTIVITY GUIDEBOOK IN THE LIVING TRADITION OF SEED SAVING 4 (2001).

2. Gordon Moyes, *GM Crops and Legal Risks for Farmers – What are We Risking?*, GORDONMOYES.COM (Mar. 20, 2009, 9:03 AM), *http://www.gordonmoyes.com/2009/03/20/gm-crops-and-legal-risks-for-farmers-what-are-we-risking*; *see also* FOOD, INC. (Participant Media 2008).

3. Monsanto Co. v. Parr, 545 F. Supp. 2d 836, 839 (N.D. Ind. 2008).

4. *Id.* at 838.

5. *Id.* at 839.

6. *Id.* at 844.

clients on the illegalities of cleaning and saving patented seeds, obtain certifications from clients confirming compliance with patent laws, and provide samples of each seed cleaned to Monsanto for testing.[7] Seed saving is becoming a lost art that will result in loss of genetic diversity throughout the soybean crop.[8] Parr's livelihood is jeopardized by restrictions on seed saving.[9] In time, the knowledge of this art will fade and with it the ability to naturally secure strong and healthy crops from year to year.

To provide adequate protection and meet maximum sustainability for all interested parties, it is essential that laws governing the soybean industry consider the soybean as a stakeholder. Existing laws controlling genetically modified soybeans protect the interests of select stakeholders. It is questionable whether stakeholders are *adequately* or *equally* protected and whether these laws promote long-term sustainability in all pertinent areas; however, it is clear that missing from the equation is a key stakeholder: the soybean itself. This paper will review the intricate legal issues and prospective solutions concerning ethical, economical, environmental, and health concerns of the genetic engineering of essential crops, with emphasis on the soybean.

Part I of the article reviews the history and competing views on the regulation of genetically engineered or genetically modified organisms (collectively, "GE"). Part II provides an overview of applicable patent laws, governing federal regulations, and state initiatives on GE crops. Part III reviews key stakeholder interests in the soybean industry including: (A) the soybean's interest grounded in ethical considerations and earth jurisprudence principles, and (B) humans and the various perspectives their interests take through a review of (1) large corporations, specifically Monsanto, and their key role in creation of genetically modified crops to maximize profit; (2) the farmers affected by Monsanto's monopoly; and (3) the consumer, through a review of the health and ethical concerns associated with consumption of genetically modified soybeans. Part IV provides suggestions on how

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7. *Id.* at 844-45 (granting a permanent injunction).

8. Allyson Martin, *Seed Savers* v. *Monsanto: Farmers Need a Victory for Wilting Biodiversity*, 24 DEPAUL J. ART, TECH. & INTELL. PROP. L. 95, 95 (Fall 2013).

9. Kelly E. Calder, *Harvesting a Lawsuit: Challenging the Enforcement and Validity of Monsanto's Transgenetic Seed Patents*, 5 KY. J. EQUINE, AGRIC. & NAT. RESOURCES L. 97, 105-06 (2013) ("But, considering 'the likelihood that any particular soybean crop that Parr cleans contains the Roundup Ready trait is substantial' because 'approximately 87.3% to 94.3% of the soybeans planted in Indiana contain Monsanto's Roundup Ready trait,' it is very likely that the injunction severely limited his potential client base or put him out of business.").

recognition of soybean rights can promote a more appropriate balancing of stakeholder interests in the regulation of GE crops.

I. Background on Genetically Engineered Crops

The regulation of GE crops involves multiple statutes and regulations related to patent protections, food safety, and labeling, and is under the control of multiple agencies. Many crops have been genetically modified and introduced into U.S. markets, leading to the formation of strong views favoring, as well as equally strong views opposing, the practice. To narrow the scope, the remainder of this paper will review the regulatory authority and stakeholder interests of the GE soybean. While the information herein will provide general information applicable to all GE crops, specific attention will be paid to the soybean in order to emphasize the effects just one crop can have on many different areas, including human health and the environment. The GE soybean will be the focus due to its prevalence in the United States, making up ninety-four percent of U.S. soybeans.[10] As the reader proceeds, the reader should keep in mind that these effects are caused by just one crop and other crops concurrently cause similar effects. In doing so, the reader will develop an appreciation for how influential GE crops are in many differing areas.

A. History

Biotechnology, as defined, is "the use of biological processes for the development of products such as foods, enzymes, drugs, and vaccines."[11] The term "Genetically Modified Organism" is defined by the Environmental Protection Agency as "[a] term that refers to plants that have had genes implanted to improve their performance by making them resistant to certain pesticides, diseases, or insects."[12] The use of biotechnology and the prevalence of GE crops in United States agriculture is a result of efforts by companies like Monsanto, a leading company in seed and crop protection industry known best for its Roundup® weed killer.[13]

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10. *About Genetically Engineered Foods*, Center for Food Safety, http://www.centerforfoodsafety.org/issues/311/ge-foods/about-ge-foods# (last visited Apr. 9, 2015).

11. Donna Vogt & Mickey Parish, *Food Biotechnology in the United States: Science, Regulation, and Issues*, U.S. Dept. of State (June 2, 1999), http://fpc.state.gov/6176.htm.

12. *Crop Glossary*, U.S. Envtl. Protection Agency, http://www.epa.gov/agriculture/ag101/cropglossary.html (last visited Apr. 15, 2015).

13. *See* Elizabeth I. Winston, *What If Seeds were Not Patentable*, 2008 Mich. St. L. Rev. 321, 329-30 (2008).

In 1982, Monsanto scientists were the first to genetically modify a plant cell.[14] In 1996, Monsanto introduced its Roundup® ready soybean.[15] Today, Monsanto's product line includes soybeans, wheat, alfalfa, canola, corn, and cotton seeds.[16] As of 2011, ninety-four percent of the U.S. soybean crops were genetically engineered to resist herbicides; further, between sixty-five and seventy-five percent of U.S. corn and cotton crops were genetically modified to be either herbicide or insect resistant.[17]

Despite the many concerns surrounding use of GE seeds, they have been widely adopted by U.S. farmers.[18] Crops are genetically modified to either create their own internal pesticide or to be resistant to pesticides. Such modifications allow farmers to use fewer pesticides and reduce plowing.[19] GE crops are used by many leading U.S. companies in their products and can be found in almost every U.S. household. GE crops are used as animal feed for the majority of U.S. livestock.[20] It is estimated that seventy percent of all processed food in the U.S. contains GE ingredients because of the prevalence of GE corn and soybeans.[21] Therefore, if a household contains conventional meat, soy products, a coca cola, a box of cereal, or a chocolate bar, it is likely persons in such household will consume a product that contains GE ingredients.

B. Proponent Arguments

Proponents of using GE crops argue that such use will allow farmers to create the greater crop yields necessary to feed the world's growing population.[22] Further, proponents claim that using GE seed is

14. *Company History*, MONSANTO, http://www.monsanto.com/whoweare/pages/monsanto-history.aspx (last visited Apr. 15, 2015).

15. *Id.*

16. *See* MONSANTO PRODUCTS, http://www.monsanto.com/products/pages/default.aspx (last visited Apr. 15, 2015).

17. Charles M. Benbrook, *Impacts of Genetically Engineered Crops on Pesticide Use in the U.S. – The First Sixteen Years*, 24 ENVT'L SCI. EUROPE 1, 2 (2012).

18. *Biotechnology Frequently Asked Questions*, U.S. DEP'T OF AGRIC., http://www.usda.gov/wps/portal/usda/usdahome?navid=AGRICULTURE&contentid=BiotechnologyFAQs.xml (last updated Mar. 27, 2015).

19. Vogt & Parish, *supra* note 11.

20. *Genetically Modified Crops: What are Possible Effects of Genetically Modified Animal Feed?*, GREENFACTS, http://www.greenfacts.org/en/gmo/3-genetically-engineered-food/6-genetically-modified-animal.htm (last visited Apr. 15, 2015).

21. Tadlock Cowan, *Agricultural Biotechnology: Background and Recent Issues*, CONG. RES. SERV. REPORTS (Sept. 2, 2010), http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1026&context=crsdocs.

22. Vogt & Parish, *supra* note 11.

better for the environment because it reduces pesticides and that GE crops have positive economic effects through concentrating control of seeds by way of patent to lower costs and provide convenience for farmers.[23] Proponents also counter concerns regarding the impacts of GE crops on human health as being unfounded because the crops are subject to federal safety guidelines.[24] Such arguments are not unfounded. As Monsanto itself stated, "by 2050, the population is expected to reach 9 billion," substantially increasing the need for "food, fuel, and clothing."[25] This figure has many people asking whether we need Monsanto to meet the demands of a growing population.

A strong argument in support of the position that GE crops are the answer to world hunger lies in the example of Golden Rice, which is a strain of rice genetically engineered to enhance iron absorption and reduce vitamin A deficiencies.[26] In developing countries, vitamin A deficiency is a serious widespread problem causing blindness and disease.[27] Alternatively, opponents of Golden Rice argue it is a poor substitute for natural sources of vitamin A.[28] Opponents also argue that Golden Rice is being used to give GE crops a better reputation. As Vandana Shiva wrote, "Genetically engineered vitamin A rice is now being used as a Trojan horse to push genetically engineered crops and foods."[29] Proponents of Golden Rice respond to such arguments by reviewing the realities of developing nations. The fact that natural vitamin A sources exist is irrelevant when such items are not accessible to third world countries.[30] As observed by the United Nations Development Program, "Western consumers naturally focus on the potential allergic reactions and other food safety issues. People in developing countries, however, may be more interested in better crop yields, nutrition, or reduced need to spray pesticides that sicken farmers."[31] This is a clear representation of the polar opposite views

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23. *Id.*

24. *Id.*

25. MONSANTO, http://www.monsanto.com/Pages/default.aspx (last visited Apr. 15, 2015).

26. Vogt & Parish, *supra* note 11. Furthermore, rice is a staple crop.

27. *Micronutricient Deficiencies*, WORLD HEALTH ORG., http://www.who.int/nutrition/topics/vad/en/ (last visited Apr. 15, 2015).

28. Food Stories, *It's the Food, Stupid! How Food and Diverse Diets Solve Nutrition Deficiencies*, GREENPEACE, (June 14, 2015), http://www.greenpeace.org/international/en/campaigns/agriculture/solution-ecological-farming/Food-Stories/.

29. PATRICK G. DERR & EDWARD M. MCNAMARA, CASE STUDIES IN ENVIRONMENTAL ETHICS 151-53 (2003).

30. *Id.*

31. *Id.*

interested parties hold on sustainability and provides a very strong argument for proponents of GE crops and GE food.

C. *Opponent Arguments*

Opponents of GE crops rest their arguments primarily on health, environmental, and economical concerns. Presently, regulations require minimal testing of GE foods before being placed on the market.[32] Such testing mirrors non-GE foods.[33] Opponents argue that the genetic engineering could cause the organism to produce increased toxins and allergens.[34] Given the lack of upfront testing for chronic effects of these modifications, GE foods that may be harmful to health are made available for consumers.[35] A study conducted by the International Journal of Biological Sciences has found that GE food consumption may cause organ damage.[36] In the study, rats fed GE foods suffered kidney and liver damage (detoxification organs) due to the increase in toxic substances foreign to the rats.[37] The study concluded by stressing the importance of putting GE food through long-term studies, as it is necessary to determine the long-term health concerns humans will face with continued consumption of GE foods.[38] Further, religious groups who rest their food choices upon kosher and halal law raise their concerns regarding the effects of GE food on their ability to avoid genetic strands derived from prohibited food sources, such as swine, as such gene strands may be introduced into products without their awareness.[39]

From an environmental standpoint, opponents disagree with arguments that GE crop harvesting is less harsh on the environment. Opponents argue that harvesting of GE crops will inevitably disrupt the natural ecosystem, as cross-pollination will affect natural or non-genetically modified crops.[40] Further, the increase in GE crops has led

32. Cowan, *supra* note 21.

33. *Id.*

34. *Id.*

35. Vogt & Parish, *supra* note 11.

36. Joel Spiroux De Vendomois, Francious Roullier, Dominique Cellier, & Gilles- Eric Seralini, *A Comparison of the Effects of Three GM Corn Varieties on Mammalian Health*, 5 INT'L J. BIOLOGICAL SCI. 706 (2009*), available at* http://www.biolsci.org/v05p0706.htm.

37. *Id.*

38. *Id.*

39. Vogt & Parish, *supra* note 11.

40. *Genetic Engineering: Why is the Release of Transgenic Crops into the Environment a Risk?*, SIERRA CLUB, http://vault.sierraclub.org/biotech/release-transgenic-crops-risk.aspx (last visited Apr. 15, 2015); *see also* FOOD, INC., *supra* note 2.

to superbugs and superweeds.[41] Researchers at Iowa State University have found that rootworms in Iowa cornfields have evolved to resist the pesticides created by Monsanto's genetically modified corn crops.[42] The industry is not responding to superweeds by scaling back the use of GE crops and associated pesticides. Conversely, when years of using Roundup® ready crops led to glyphosate-resistant weeds,[43] the industry responded to the problem by developing new technology, including the development of new crop varieties that are resistant to other forms of chemical pest controls like the 2,4-D resistant corn variety.[44]

Finally, opponents stress concern over the patenting of GE crops, as they are causing monopolistic effects in the market that will affect domestic trade and force cooperation from farms.[45] Opponents' biggest concern, however, is that the concentration of control of the seed market within a few powerhouse companies will allow such companies to influence[46] regulations leading to the relaxation of regulatory processes and, consequently, quick approvals and inadequate review of health and environmental concerns within the regulatory process.[47]

II. Existing Legal Framework for Regulation of Genetically Engineered Crops

"[T]he recurring question which has plagued public regulation of industry [is] whether the regulatory agency is unduly oriented towards the interests of the industry it is designed to regulate, rather than the public interest it is designed to protect."[48] In Justice Douglas'

41. Scott Killman, *Monsanto Corn Plant Losing Resistance*, Wall St. J. (Aug. 29, 2011), http://online.wsj.com/article/SB10001424053111904009304576532742267732046.html.

42. *Id.*

43. *Agent Orange Ready Corn*, Food & Water Watch, http://www.foodandwaterwatch.org/food/genetically-engineered-foods/24-d-corn/ (last visited Apr. 15, 2015).

44. *Id.* ("In particular, application of Monsanto's Roundup has spawned glyphosate-resistant weeds, a problem that is driving farmers to apply older, more toxic herbicides and to reduce conservation tilling to combat weeds. Now, to treat the problem of glyphosate-resistant weeds, biotechnology companies are simply creating crops resistant to a variety of chemicals.").

45. *See generally* Winston, *supra* note 13.

46. There is already evidence that corporations have great influence on regulatory authorities. There are numerous examples of leading Monsanto employees going to work for the regulatory authorities. For example, Margaret Miller, a Monsanto chemical lab supervisor, left Monsanto in 1989 to work for the FDA. *See* Jennifer Ferrara, *Revolving Doors: Monsanto and the Regulators*, http://www.psrast.org/ecologmons.htm (last visited Apr. 15, 2015).

47. Vogt & Parish, *supra* note 11.

48. Sierra Club v. Morton, 405 U.S. 727, 747 (1972) (Douglas, J., dissenting).

dissenting opinion in *Sierra Club v. Morton*, Douglas warns that the pressures placed on federal agencies by advisory committees and friendly working relationships may cause industries to become "industry minded" and skew the meaning of "public interest."[49] It is for these reasons that we have procedural protections in place to ensure agency actions follow statutory guidelines. For example, the National Environmental Policy Act is a procedural law requiring that an environmental analysis be undertaken for any "major federal action" that significantly affects the quality of the human environment.[50] Also, the Administrative Procedure Act provides an avenue by which citizens can challenge final actions by administrative agencies that are found to be arbitrary, capricious, an abuse of discretion, or not in accordance with the law.[51] While these administrative provisions apply safeguards to the application of regulations, these principles heavily rely on correct application of applicable regulations, which may be inadequate as discussed below.

The adequacy of protections afforded to the various stakeholders is a topic of much debate. More favorable laws are applied to select stakeholders, which results in industry imbalances. As the interest of the soybean itself is not considered in any of the governing laws, they receive no protections. A soybean industry that balances the interests of all stakeholders would result in a more well-rounded and sustainable industry; however, this would require the industry to first recognize the unaccounted-for soybean. The governing law, including patent law and federal agency regulations, controlling the soybean industry, however, does consider and provide protection for various stakeholders in the industry, including corporate seed companies, farmers, consumers, the environment, and even the economy.

A. Patent Law, Plant Protection Statutes, and Seed Licensing

Under 35 U.S.C. § 101, which governs the patentability of inventions, "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title."[52] The Patent and Trademark Office ("PTO") has held that plants fall within the meaning of "manufacture" or "composition of matter" and may therefore qualify for

49. *Id.* at 745-47 (Douglas, J., dissenting).
50. 42 U.S.C. § 4322 (2012).
51. 5 U.S.C. § 706 (2012).
52. 35 U.S.C. § 101 (2012).

a utility patent.[53] "To obtain utility patent protection, a plant breeder must show that the developed plant is new, useful, and non-obvious."[54] The Plant Patent Act ("PPA") issues plant patents for asexually reproducing plants, which provide less coverage and have less stringent requirements than § 101 utility patents. This act does not protect sexually reproducing plants or plants that reproduce via seed, such as the soybean.[55] Under the Plant Variety Protection Act ("PVPA"), the U.S. Department of Agriculture may issue Certificates of Protection for select sexually reproducing plant varieties. This certificate protects a holder "if someone sells or markets the protected variety, sexually multiplies the variety as a step in marketing, uses the variety in producing a hybrid, or dispenses the variety without notice that the variety is protected."[56] This protection does provide for a research exemption, which allows breeding of new varieties of seed for bona fide experimental purposes and a saving seed exemption, which allows farmers who have "legally purchase[d] and plant[ed] a protected variety [to] save the seed from these plants for replanting on his own farm."[57]

In *J.E.M. Ag Supply, Inc.* v. *Pioneer Hi-Bred International, Inc.*, J.E.M Ag Supply challenged the validity of Pioneer's patents on hybrid corn seed products, claiming that sexually reproducing plants are not patentable under 35 U.S.C. § 101 because the Plant Patent Act (PPA) and the Plant Variety Protection Act (PVPA) are specific statutory enactments that address the protection of plant life and "thus each carves out subject matter from § 101 for special treatment."[58] In a six to two decision written by Justice Thomas[59] the court upheld the issuance of § 101 utility patents (the most protective patent) for plant life by holding that, "newly developed plant breeds fall within the subject matter of § 101, and neither the PPA nor the PVPA limit the scope of § 101's coverage."[60] These patent statutes provide three avenues of protection that seed companies like Monsanto can use to ensure control of their seed products.

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53. J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 131 (2001).

54. *Id.*

55. Tempe Smith, *Going to Seed?: Using Monsanto as a Case Study to Examine the Patent and Antitrust Implications of the Sale and Use of Genetically Modified Seeds*, 61 ALA. L. REV. 629, 632-33 (2010).

56. *Id.* at 634.

57. *Id.*

58. *J.E.M. Ag Supply, Inc.*, 534 U.S. at 129.

59. Doug Snodgrass, *Conflicts of Interest: Ex Monsanto Lawyer Clarence Thomas to Hear Major Monsanto Case*, ORGANIC CONSUMERS ASS'N (Mar. 11, 2010), http://www.organicconsumers.org/articles/article_20437.cfm.

60. *J.E.M. Ag Supply, Inc.*, 534 U.S. at 145.

In addition to patent laws, Monsanto also uses licensing and stewardship agreements to control the use and distribution of its seeds by distributors and growers. These agreements contain many carte blanche clauses that preserve Monsanto's interest in their seeds, as well as clauses that circumvent PVPA saved seed and research exemptions. Finally, through aggressive compliance, enforcement, and marketing, including the creation of a "blacklist" of persons who violate contractual and legal protections, Monsanto ensures maximum protection of its seeds.[61]

B. Federal Regulations

The regulatory framework of the soybean industry involves multiple agencies and statutes. This is due to the fact that there are no specialized regulatory agencies, statutes, or regulations to address GE crops, foods, and products "based on the assumption that the process of biotechnology itself pose[s] no unique or special risks . . . [and] that a commercial product, regardless of its manner of production, should be regulated based on the product's composition and its intended use."[62] Alternatively, GE products are regulated by existing regulations, and any discrepancies are addressed by adopting additional regulations and guidelines.[63] The Food and Drug Administration ("FDA"), the U.S. Department of Agriculture ("USDA"), and the Environmental Protection Agency ("EPA"),[64] are the primary regulatory authorities overseeing elements of the industry that are applicable to the stakeholders, two of which are discussed herein.

1. Food and Drug Administration

The FDA is responsible "for the safety of food and animal feed, and for the safety and efficacy of human drugs and biologics, and

61. *See* Winston, *supra* note 13, at 327-33.

62. PEW INITIATIVE ON FOOD AND BIOTECHNOLOGY, GUIDE TO U.S. REGULATION OF GENETICALLY MODIFIED FOOD AND AGRICULTURAL BIOTECHNOLOGY PRODUCTS, PEW CHARITABLE TRUST (Sept. 3, 2001), *available at* http://www.pewtrusts.org/en/research-and-analysis/reports/2001/09/03/guide-to-us-regulation-of-genetically-modified-food-and-agricultural-biotechnology-products.

63. *Id.*

64. Cowan, *supra* note 21. Under the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA"), the EPA approves the use of pesticides, including pesticides genetically engineered into plants that are safe for the environment. Also, under the FFDCA, the EPA determines the pesticide tolerance levels for food. The FDA uses regulations imposing various testing and permitting requirements to oversee environmental effects.

animal drugs."[65] Under the Federal Food, Drug, and Cosmetic Act ("FFDCA"), the FDA applies various standards to ensure that all imported and domestic food products are safe and properly labeled.[66] GE foods are regulated the same way as foods created by conventional means; however, there are safety precautions, guidelines, and consultation procedures that do provide some regulations applicable to GE foods. First, the FDA requires a special review process under certain circumstances, such as when the nutrients of GE foods differ from traditional varieties or when the GE food differs significantly in composition to foods of comparable varieties.[67] Next, the FDA encourages developers of GE food to participate in a voluntary consultation process to resolve safety and regulatory issues prior to marketing.[68] Finally, though special labeling[69] is only required when GE foods are significantly different than their conventional counterparts, the FDA has guidelines on the voluntary labeling of GE foods, which suggests providing truthful, simple, and non-misleading information on the presence or absence of GE ingredients in a particular product.[70] Any statements regarding GE foods, however, must meet the labeling requirements applicable to all foods.[71]

Consumer demand to require the enactment of GE labeling laws is gaining pressure as evidenced by the initiatives occurring at the state level. As of April 2012, 1.1 million signatures were added to the Just Label It FDA petition.[72] The FDA, however, has failed to take

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65. *Id.*

66. Federal Food, Drug, and Cosmetic Act, 21 U.S.C.A. § 343 (2014).

67. Vogt & Parish, *supra* note 11.

68. *Id.*

69. GE foods must still comply with the labeling regulations applicable to conventional foods. As described in FDA's Draft Guidance, under section 403(a)(1), a food is misbranded if its labeling is false or misleading in any particular way. Section 201(n) of the act provides additional guidance on how labeling may be misleading. It states that labeling is misleading if it fails to reveal facts that are material in light of representations made or suggested in the labeling, or material with respect to consequences that may result from the use of the food to which the labeling relates under the conditions of use prescribed in the labeling, or under such conditions of use as are customary or usual. *DRAFT Guidance for Industry: Voluntary Labeling Indicating Whether Foods Have or Have Not Been Developed Using Bioengineering; Draft Guidance,* FOOD & DRUG ADMIN., http://www.fda.gov/food/guidancere gulation/guidancedocumentsregulatoryinformation/labelingnutrition/ucm059098.htm (last updated Dec. 16, 2014).

70. *Id.*

71. *Id.*

72. *FDA Responds to 1.1 Million*, JUST LABEL IT (Apr. 5, 2012), http://justlabelit.org/fda-responds-to-1-1-million/. Petition available at http://justlabelit.org/wp-content/uploads/2011 /09/gelabelingpetition.pdf.

action despite the overwhelming support.[73] Further, attempts to pass legislation that would clear the way for state GE labeling laws have been unsuccessful.[74] In May 2013, the U.S. Senate also voted against a measure that would allow states to decide whether or not to enact labeling requirements.[75] In April 2014, another bill, the Safe and Accurate Food Labeling Act, was introduced in the house.[76] This bill would require the labeling of GE foods, "if they are found to be unsafe or materially different from foods produced without biotech ingredients."[77] Time will tell whether this act will make it through the legislature. If so, this may have further effects on state initiatives.[78]

2. U.S. Department of Agriculture

The Animal and Plant Health Inspection Service ("APHIS") under the USDA "regulates the importation, interstate movement, and field testing of GE plants and organisms that are or might be plant pests under the Plant Protection Act."[79] Under this act, APHIS must authorize the introduction of GE plants into the environment or market through a permitting or notification process. APHIS also provides guidance and restrictions on the testing and movement of GE plants to ensure that agriculture, human health, and the environment are not affected.[80]

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73. Morgan Anderson Helme, *Genetically Modified Food Fight: The FDA Should Step up to the Regulatory Plate so States Do Not Cross the Constitutional Line*, 98 MINN. L. REV. 356, 379 (2013) (asserting that "[d]espite the large number of consumer comments–more than any previous petition filed with the FDA–the FDA's response was simply that it needs more time to make a decision").

74. Tiffany B. Wong, *Playing Politics with Food: Comparing Labeling Regulations of Genetically Engineered Foods Across the North Atlantic in the United States and European Union*, 23 SAN JOAQUIN AGRIC. L. REV 243, 268-69 (2014) (including the Genetically Engineered Food Right-To-Know Act).

75. Michael McAuliff, *GMO Labeling Bill Voted Down in Senate*, THE HUFFINGTON POST (May 24, 2013), http://www.huffingtonpost.com/2013/05/23/gmo-labeling-bill-genetically-modified-food_n_3325972.html.

76. Christopher Doering, *Legislation Would Ban State GMO Labeling Measures*, USA TODAY (Apr. 9, 2014), http://www.usatoday.com/story/news/politics/2014/04/09/genetic-labeling-bill/7519937/.

77. *Id.*

78. *Id.*

79. Cowan, *supra* note 21.

80. *Id.*

A. State Initiatives

1. State Initiatives and Enacted Legislation

In *New State Ice Co.* v. *Liebmann*, Justice Brandeis explains, "It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."[81] While the FDA has failed to answer requests to develop specific labeling laws for GE products, states have taken the matter into their own hands. Recently, states have been active in developing state legislation or constitutional provisions in support of GE labeling in light of the FDA's failure to regulate.[82]

In November 2012, Proposition 37, a state GE labeling initiative that gained national attention,[83] was voted upon but was ultimately defeated at the polls.[84] The state of Washington attempted a similar initiative shortly thereafter but was also unsuccessful.[85] Legislation has been introduced in many other states as well, including Florida, New York, and Georgia.[86] In fact, as of March 17, 2015, "more than 70 bills have been introduced in over 30 states."[87]

Three states have been successful in introducing legislation. Connecticut and Maine have passed bills that include trigger clauses, and Vermont enacted the first labeling law without contingencies.[88] Maine's act[89] and Connecticut's act[90] require specific disclosures to be listed for GE food packaging.[91] Both acts, however, provide exemptions for "[GE] foods served at restaurants, medical foods, and alcohol."[92] While Maine and Connecticut's laws provide a substantial step in the regulation of GE food, neither state's laws become active automati-

81. New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932).

82. *See generally* Wong, *supra* note 74.

83. *See generally* ATTORNEY GENERAL, PROPOSITION 37, GENETICALLY ENGINEERED FOODS. LABELING. INITIATIVE SUIT. *available at* http://vig.cdn.sos.ca.gov/2012/general/pdf/37-title-summ-analysis.pdf (last visited Apr. 15, 2015).

84. Wong, *supra* note 74, at 260.

85. *Id.* at 260-61.

86. *GE Food Labeling: States Take Action*, CTR. FOR FOOD SAFETY (June 10, 2014), http://www.centerforfoodsafety.org/fact-sheets/3067/ge-food-labeling-states-take-action.

87. *State Labeling Initiatives*, CTR. FOR FOOD SAFETY, http://www.centerforfoodsafety.org/issues/976/ge-food-labeling/state-labeling-initiatives (last visited Apr. 15, 2015).

88. *Id.*

89. ME. REV. STAT. ANN. tit. 22, § 2591 (2014).

90. CONN. GEN. STAT. ANN. § 21a-92 (2014).

91. Wong, *supra* note 74, at 264.

92. *Id.*

cally.[93] The Maine and Connecticut acts will not become active legislation until a minimum number of states enact GE labeling laws and certain aggregate population amounts are met.[94]

2. Vermont Legislation and Constitutional Challenges

On May 8, 2014, Vermont became the first U.S. state to enact successful GE labeling legislation.[95] While other states have enacted GE labeling legislation, including Maine and Connecticut, Vermont is the first state to enact legislation that does not require other states to enact GE labeling legislation in order for it to become effective.[96] Act 120, An Act Relating to the Labeling of Food Produced with Genetic Engineering ("Act 120" or the "Act"), received widespread support from local and national environmental groups, businesses, farmers, and residents.[97] Large corporations, including Vermont's Ben and Jerry's and Dr. Bronner's Magic Soaps, were also supportive of Vermont's labeling legislation.[98]

Act 120 requires food produced for human consumption to be labeled if they are produced or partially produced with genetic engineering.[99] The law provides specific rules for labeling when the commodity is packaged or sold free of packaging.[100] While Act 120 is far reaching, the act does include exemptions, including "food consisting entirely or derived from an animal which has not itself been produced with genetic engineering, regardless of whether the animal has been fed or injected with any food, drug, or other substance produced with genetic engineering" and food sold at a restaurant for immediate consumption.[101] Vermont's Attorney General's office began drafting implementing regulations in June 2014, and the law is ex-

93. *Id.* at 261-62.

94. *Id.* at 264.

95. Act Relating to the Labeling of Food Produced with Genetic Engineering, 9 V.S.A. Chapter 82A, *available at* http://www.leg.state.vt.us/docs/2014/Acts/ACT120.pdf.

96. Linda A. Goldstein, Jeffrey S. Edelstein & Marc Roth, *Vermont Passes GMO Labeling Law*, ASSN. OF CORP. COUNSEL (May 29, 2014), http://www.lexology.com/library/detail.aspx?g=63a87de5-d911-4317-878d-ce779e57e5f3.

97. *Gov. Peter Shumlin Signs First-in-the-Nation Genetically Engineered Foods Labeling Law*, VERMONT.GOV (May 8, 2014), http://governor.vermont.gov/newsroom-gmo-bill-signing-release.

98. *Who We Are*, VERMONT RIGHT TO KNOW GMOS, http://www.vtrighttoknowgmos.org/who-we-are/ (last visited Apr. 15, 2015).

99. 9 V.S.A. Chapter 82A § 3043.

100. *Id.* at § 3043(b)(2).

101. *Id.* at § 3044.

pected to be in full force and effect by July 1, 2016.[102] While the specific details regarding enforcement of the Act will not be known until rule making is complete, violations of the act could cost violators as much as $1,000 per day, per product.[103]

While Act 120 provides a clear mandate with enforceable provisions, what may be key to the Act's success is its establishment of the Genetically Engineered Food Labeling Special Fund and the Act's provisions that require the Governor to request funds to support the implementation and administration of the act.[104] In Governor Shumlin's announcement that Act 120 was signed into law, the Governor explained how the fund should go to supporting implementation of the act, "including costs and fees associated with expected challenge in court by food producers who do not want to disclose this information to consumers."[105]

The legal challenges to Act 120 began almost immediately. In June 2014, the Grocery Manufacturers Association commenced legal action against Vermont's Attorney General, William Sorrell, challenging the act on various constitutional grounds, including First Amendment and Commerce Clause Challenges.[106] Attorney General Sorrell is challenging this lawsuit and seeking dismissal based upon fundamental constitutional law principles, including, for example, that Act 120 serves a legitimate state interest.[107] While Vermont has a team of lawyers ready to defend any challenges to Act 120, there are various constitutional questions posed by the legislation.

State initiatives are critical to the advancement of consumer interest in GE labeling. However, the constitutionality of such initiatives presents multiple hurdles, including issues arising under the Supremacy Clause, Commerce Clause, and First Amendment.[108] While

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102. Stephaine Boucher, *Rule Making Period has Begun; Public Input Sought*, VERMONT RIGHT TO KNOW GMOS (June 3, 2014), http://www.vtrighttoknowgmos.org/rule-making-period-begun-public-input-sought/.

103. 9 V.S.A. Chapter 82A § 3048(a).

104. *Id.* at § 4.

105. VERMONT.GOV, *supra* note 97.

106. Christie Smythe & Duane D. Stanford, *Vermont Sued by Grocery Group to Block GMO Food Labeling Law*, BLOOMBERG BUS. (June 13, 2014), http://www.bloomberg.com/news/articles/2014-06-13/vermont-sued-by-grocer-group-to-block-gmo-food-label-law.

107. Pat Bradley, *Vermont Attorney General Files for Dismissal of GMO Labeling Lawsuit*, WAMC NORTHEAST PUB. RADIO (Aug. 11, 2014), http://wamc.org/post/vermont-attorney-general-files-dismissal-gmo-labeling-lawsuit.

108. *See generally* Laura Murphy et al., *More than Curiosity: The Constitutionality of State Labeling Requirements for Genetically Engineered Foods*, 38 VT. L. REV. 477 (2013) (discussing concerns over genetically engineered food).

some scholars take the position that these issues are unsurpassable,[109] other scholars take the position that such challenges can be overcome with the enactment of "properly developed state labeling laws."[110] The true test may be the outcome of challenges to Vermont's labeling law. Depending on the outcome of litigation surrounding the Vermont law, other states will, at a minimum, have the ability to refine their approach to state labeling initiatives to avoid constitutional challenges.

III. Evaluation of Competing Stakeholder Interests

A. *The Soybean and Earth Jurisprudence Principles*

Earth jurisprudence in the broadest sense describes the theory that all natural beings should have legal rights in and of themselves. In describing Thomas Berry's views of earth jurisprudence as outlined in *The Origin, Differentiation and the Role of Rights,* Cormac Cullinan states,

> [R]ights of all beings are derived from the most fundamental source of all, the universe. Since the universe is . . . 'a communion of subjects and not a collection of objects,' it follows that all the component members of the universe are subjects capable of holding rights, and have as much right to hold rights as humans.[111]

Does this mean that soybeans should have the same rights afforded humans? Thomas Berry explains that each natural being has three rights:

> [T]he right to be, the right to habitat, and the right to fulfill its role in the ever renewing processes of the Earth Community . . . recognizing these rights amounts to an acknowledgement that each member of the Community is a subject who has an inalienable right to be part of the Community, and to continue expressing itself in relationships with the other members of the Community.[112]

Applying these rights to the soybean will naturally be different than when applying them to humans. In sum, there are "soybean rights" and there are "human rights," and each being represents a member of an interconnected community.

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109. *See generally* Helme, *supra* note 73.

110. Murphy et al., *supra* note 108, at 553; *see also* Stephen Tan & Brian Epley, *Much Ado about Something: The First Amendment and Mandatory Labeling of Genetically Engineered Foods*, 89 Wash. L. Rev. 301 (2014) (discussing the history of food labeling laws and the impacts of the First Amendment on GMO labeling laws).

111. Cormac Cullinan, Wild Law: A Manifesto for Earth Jurisprudence 96 (2d ed. 2011).

112. *Id.* at 101.

A soybean plant begins life when its seed is planted. Using the food within the seed, the seed will develop roots, sprout above the earth, and develop a stem. From here, leaves will form to reach for and obtain energy from the sun. Then, soybeans will form in pods upon the plant. Eventually, these pods will be consumed by other members of the earth community, or the pods will open to allow the seeds to fall to the earth to restart the life cycle.[113] Soybeans are a valuable source of nutrition for both humans and animals. Soybeans have become a key component of the human diet and are of great importance to the food supply. It can be said that humans have a high dependency on soybeans for food production, which in turn affects areas like the economy. The soybean–human relationship is an example of Thomas Berry's theory that each subject has certain rights to be a part of their community and that each subject is defined by their relationships with other members of the community.

Having concluded that a soybean has a right to exist within its community and that the soybean's role in the community can be defined at least in part by its relationship to humans, what then is the substance of soybean rights? A fundamental river right could be described as the right to flow. A human's fundamental right could be described in terms of its ability to "play a role in life that gives full expression to our natures. Without the freedom to have a family, to express ourselves freely . . . , our ability to express our humanity fully is restricted."[114] In consideration of the soybean's fundamental role in its community, it follows that a soybean's fundamental rights should at a minimum include the right to grow, complete their life cycle, and reproduce. If these fundamental rights are protected, the soybean will be able to produce a continuous supply of soybeans that humans can use to fulfill nutritional needs or use as a resource, thus fulfilling the soybean's role in the earth community.

"Part of the challenge posed by Earth Jurisprudence is to develop governance methods that prevent humans [from] infringing [upon] the fundamental Earth rights of other members of the Earth Community."[115] Genetically engineering crops and the patenting of seeds have infringed upon fundamental rights of the soybean, and advanced upcoming technology presents the danger of even further infringement. As discussed above, the art of seed saving is a historical art practiced by generations of farmers for the purpose of ensuring strong and healthy crops in subsequent seasons. To successfully save

113. KAUFMAN, *supra* note 1, at 18.
114. CULLINAN, *supra* note 111, at 104.
115. *Id.* at 105.

seeds, the plant must be able to "go to seed." For a bean plant this may be about six weeks after their eating stage.[116] When a plant goes to seed, its seeds are ready to be replanted and restart the life cycle.[117] In the U.S., this last stage cannot occur for the majority of soybeans because of the patents placed upon them by Monsanto. Growers who purchase patented soybeans from Monsanto are bound by the Monsanto Technology and Stewardship Agreement, which provides that growers will use the purchased seed to plant one single commercial crop in one growing season and will not save seed from the crop for future planting.[118] Now, each year farmers must purchase new-patented soybeans to plant. The seeds from previous crop yields are never able to complete their life cycle and fulfill their role in the community.

What if governance methods allowed humans to infringe even further on fundamental soybean rights by preventing planted soybeans from even producing seeds capable of being replanted? Genetic Use Restriction Technologies ("GURTs") insert a genetic on-off switch in plants to prevent the unauthorized use of genetic traits contained within the plant. In 1998, the U.S. Department of Agriculture and the Delta & Pine Land Company received a U.S. patent to use a genetic process that would block genetically engineered plants from producing fertile seeds.[119] While Monsanto has not implemented this technology yet into their patented soybeans in upholding their 1999 commitment "not to commercialize sterile seed technology in food crops," they have contemplated their use by consulting with experts on the issue.[120]

While to some it is clear that GURTs would infringe on the soybeans' fundamental right to reproduce, others argue that the benefits of sterilization, including technology protection, justify the infringement. This is hardly surprising considering just eighty-seven years ago the Supreme Court of the United States in *Buck* v. *Bell* allowed the sterilization of a mentally handicapped woman, Carrie Buck, by reason that "[t]hree generations of imbeciles are enough."[121] This case has not been expressly overruled.

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116. *Seed Saving Instructions for Beginners*, INT'L SEED SAVING INST., http://www.seedsave.org/issi/904/beginner.html (last visited Apr. 15, 2015).

117. *Id.*

118. *Monsanto Co.*, 545 F. Supp. 2d at 838.

119. Alejandro E. Segarre & Jean M. Rawson, *The "Terminator Gene" and Other Genetic Use Restriction Technologies (GURTs) in Crops*, CONG. RES. SERV. REPORTS (Oct. 21, 1999), *available at* http://crs.ncseonline.org/NLE/crs/abstract.cfm?NLEid=21.

120. *Myth: Monsanto Sells Terminator Seeds*, MONSANTO, http://www.monsanto.com/newsviews/pages/terminator-seeds.aspx (last visited Apr. 15, 2015).

121. Buck v. Bell, 47 S. Ct. 584, 585 (1927).

As it stands today, the human governance systems in place do not prevent humans from infringing upon the soybean's fundamental rights to complete its life cycle and reproduce in order to fulfill its right to be, to habitat, and fulfill its role in the ever-renewing process of the earth community.

1. Rights and Standing

Earth Jurisprudence suggests the term "rights" should be broadly construed to include, as described above, "the principle that other natural entities are entitled to fulfill their role within the earth community."[122] However, sometimes rights are more easily understood as legally enforceable rights. The legal system recognizes rights in terms of "an interest that is legally protected in the sense that it can be enforced in a court of law . . . ."[123] Presently, the soybean does not have rights recognizable in the legal system; however, this does not mean this will always be the case, as there are many examples that support the idea that subjects of nature should be (and may be) extended legally recognizable rights.

Aldo Leopold opens his work, *The Land Ethic*, with a story from the *Odyssey* sparking an interest in the evolution of rights.

> When god-like Odysseus returned from the wars of Troy, he hanged all on one rope a dozen slave girls whom he suspected of misbehavior during his absence . . . . The girls were property. This disposal of property was then, as now, a matter of expediency, not right or wrong . . . . During the three thousand years which have since elapsed, ethical criteria have been extended to many fields of conduct.[124]

The evolution of rights has come a long way since the days of Odysseus. Rights have been extended to slaves, women, Native Americans, blacks, and even animals.[125] History tells us that each time rights were extended, a "paradigm shift" occurred, and each "shift" occurred by the same steps. First, the idea would be met with shock, then discussion would commence that would eventually lead to acceptance.[126] While, for many, the extension of rights to soybean may still come as a shock, for others, discussions have already begun.

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122. CULLINAN, *supra* note 111, at 97.

123. *Id.* at 96.

124. ALDO LEOPOLD, *The Land Ethic*, *in* A SAND COUNTY ALMANAC 1 (1949), *available at* http://rintintin.colorado.edu/~vancecd/phil3140/Leopold.pdf.

125. Wymyslo, *infra* note 135.

126. CULLINAN, *supra* note 111, at 57-61.

Legally enforceable rights are rights that may be ratified in a court of law. In the United States, the Constitution dictates access to the court system. The Cases and Controversies Clause of the Constitution requires one establish standing before they are able to bring an action in a U.S. court.[127] To establish standing, a prospective litigant must show "injury in fact," "causation," and "redressability."[128] A genetically modified soybean clearly has suffered injury when its fundamental rights have been infringed upon. This injury could be redressed in a variety of ways, including the prohibition of patents and seed saving laws; however, a soybean cannot presently establish standing.

In *Sierra Club* v. *Morton*, Sierra Club, an environmental organization, brought suit against the U.S. Forest Department seeking an injunction and declaratory judgment to prevent the department from approving Disney World's plan to develop a ski resort in the Mineral King Valley in the Sequoia National Forrest.[129] The District Court held that Sierra Club had standing and raised questions "concerning possible excess of statutory authority, sufficiently substantial and serious to justify a preliminary injunction . . . ."[130] However, the Court of Appeals reversed on the basis that Sierra Club did not have standing. The U.S. Supreme Court granted review and held that Sierra Club did not have standing to bring the action on behalf of Mineral King Valley because Sierra Club could not show that their organization or any of their members suffered individual harm.[131]

In its complaint, Sierra Club alleged the development "would destroy or otherwise adversely affect the scenery, natural and historic objects and wildlife of the park, and would impair the enjoyment of the park for future generations."[132] The Court reasoned this injury would only be suffered by persons who use Mineral King Valley.[133] In reading the alleged injury, it is clear there are two separate injuries expressed: (1) adverse effects on scenery, natural objects, historic objects, and wildlife, and (2) impairment of enjoyment of the park. The Court overlooked the first alleged injury when it concluded the injury would only affect those who use Mineral King Valley. While the second alleged

127. U.S. CONST. art. III, § 2, cl. 1.

128. *CRS Annotated Constitution*, LEGAL INFO. INST., http://www.law.cornell.edu/anncon/html/art3frag17_user.html (last visited Apr. 15, 2015).

129. *See generally* Sierra Club v. Morton, 405 U.S. 727 (1972).

130. *Id.* at 731.

131. *Id.* at 741.

132. *Id.* at 734.

133. *Id.* at 735.

injury would only affect those who use Mineral King Valley because it is they who may no longer enjoy the park, the same persons who use the Valley would not necessarily be the *only* ones to suffer from adverse effects on the scenery, natural and historic objects, or wildlife. These injuries are suffered by nature or Mineral King Valley itself. Consequently, they too should be found to have suffered the "individual harm" required to establish standing.

In Christopher Stone's article, *Should Trees Have Standing?—Toward Legal Rights for Natural Objects (1972)*, Stone states to hold rights, the holder need not be human, an inanimate object will suffice. For example, corporations, partnerships, trusts, and states are all right holders that are considered persons for statutory or constitutional purposes. Ships are even referred to by gender. Further, Stone explains how inanimate objects, incompetent persons, and infants cannot speak on behalf of their own interests.[134] Under the Endangered Species Act, some courts have even discussed the idea of species having their own legal status.[135] Alternatively, lawyers, interested parties, guardians, or friends speak for them, protect their rights, oversee their affairs, and represent their interests in court. As applied to nature, "[w]e should have a system in which, when a friend of a natural object perceives it to be endangered, he can apply for a creation of a guardianship."[136] This system could run similar to other guardianship programs in place, and provide a mechanism by which objects of nature could have rights, and establish standing in court.[137]

Justice Douglas of the U.S. Supreme Court dissented in *Sierra Club* v. *Morton*,[138] relying heavily on Christopher Stone's article. Justice Douglas argued environmental objects should have standing to sue for their own preservation and interests as an inanimate object whose interests are expressed through persons who can adequately speak on their behalf.[139] Dismissing arguments that allow objects of nature to bring suit on their own behalf would result in judicial lawmaking, overriding the authority of federal agencies. Douglas found that a person with an intimate relation with the inanimate object would be the best spokesperson, as federal agencies are often too absorbed in industry

134. Christopher D. Stone, *Should Trees Have Standing?—Toward Legal Rights for Natural Objects*, 45 S. CAL. L. REV. 450, 464 (1972).

135. Joanna B. Wymyslo, *Standing for Endangered Species: Justiciability Beyond Humanity*, 15 U. BALT. J. ENVTL. L. 45, 55 (2007).

136. Stone, *supra* note 134.

137. *Id.*

138. *Sierra Club*, 405 U.S. at 742 (Douglas, J., dissenting) (suggesting that the case would more properly be named *Mineral King* v. *Morton*).

139. *Id.*

needs to give unbiased representation.[140] Douglas did not find that federal agencies are corrupt, he merely reasoned that their vision of the subject matter is clouded by the blanket of smoke that represents industry influences.[141] For these reasons, an unbiased neutral party would be the best representative of the rights of objects of nature.

In sum, the idea that soybeans should have legally cognizable rights and the ability to establish standing in court, perhaps through a guardian or on the theory that the soybean is an inanimate object like a corporation, is not as absurd as the reader might think. Analogous objects already enjoy these options and the evolution of rights suggests that rights are being extended to objects of nature.

2. Ethics

"Descartes . . . killed the Earth and all its living beings. For him the natural world was a mechanism. There was no possibility of entering into a communion relationship. Western humans became autistic in relation to the surrounding world."[142] This statement by Thomas Berry is a good summary of how historical scientific advances by leading scientists, mathematicians, and philosophers of the Enlightenment period caused humans to develop a belief that they are separate from nature and that nature is merely something for their benefit. Currently, human beliefs tend to be anthropocentric in nature. If such beliefs were to shift to fit biocentric or ecocentric attitudes, a more holistic approach to soybean use and regulations could result; however, evidence suggests regulations are instead being influenced by egocentric attitudes, similar to the attitudes of Descartes and other scholars of the Enlightenment period.

Humans have manipulated objects of nature since the beginning of time. Advances in science have increased human's ability to manipulate items of nature. Biotechnology, which includes genetic engineering and gene splicing, is the manipulative technique based on alteration of the cellular and sub-cellular structures of living things, developed after the discovery of DNA in 1953.[143] The genetic composition of organisms naturally changes based on nature's instruction, is

140. *Id.* at 745.

141. *Id.* at 745-47.

142. CULLINAN, *supra* note 111, at 46.

143. Sheila Jasanoff, *Biotechnology and Empire: The Global Power of Seeds and Science*, 21 OSIRIS 273, 276 (2006), *available at* http://www.hks.harvard.edu/sdn/articles/files/Jasanoff-Empire.pdf.

constantly evolving, and supports a balanced ecosystem.[144] Biotechnology allows humans to modify the genetic composition of organisms, a task that many regard as exceeding a human's authority in light of reasonable ethical duties and "[r]eflects a lack of respect for life itself."[145] Further, such manipulation could have harsh ramifications, given our minimal understanding of the ecosystem. "To force alien words into the plant's poem, but we [have] a problem. We barely know the root language . . . ."[146] Despite the consequences that could arise from genetic engineering, humans continue the practice.

This egocentric attitude places humans in a "conqueror" or "god-like" role.[147] Cormac Cullinan describes this as the "master species" and explains how humans no longer live in the real universe. Conversely, humans live in the "homosphere" where human supremacy prevails.[148] Aldo Leopold, in *The Land Ethic*, explains how, in human history, the conqueror role is always self-defeated because the conqueror does not appreciate the importance of community. "[T]he individual is a member of a community of interdependent parts. His instances prompt him to compete for his place in that community, but his ethics prompt him also to co-operate (perhaps in order that there may be a place to complete for)."[149]

Soybeans are members of the earth community and play a vital role in the prosperity of many other community members.[150] Monsanto does not cooperate with all members of the earth community, especially with the soybean. Monsanto chooses instead to conquer the soybean (and arguably other stakeholders, including small farmers) by manipulating its genetic makeup and controlling, how, when, where, and with whom it can prosper and complete its role in the commu-

144. Debra M. Strauss, *Defying Nature: The Ethical Implications of Genetically Modified Plants*, 3 J. FOOD L. & POL'Y 1, 22 (2007).

145. *Id.*

146. *Id.* at 1.

147. CULLINAN, *supra* note 111, at 51-54.

148. *Id.* at 51-54.

149. LEOPOLD, *supra* note 124.

150. The concept of the earth community requires an understanding that all natural objects are a part of communities that are part of a larger system. "The 'Earth Community' then can be understood as being made up of all the smaller communities at different levels that are embedded in the whole system that we call earth." As applied to soybeans, the soybean community is a community within the larger earth system. As soybeans are a used by humans, they play a role in the human community and the earth community as a whole. For example, the soybean community is central to the well being of both an individual soybean farmer and the larger agricultural market. CULLINAN, *supra* note 111, at 147.

nity.[151] The Industrial Revolution brought substantial improvements to human's quality of life, but the cost of progress resulted in harsh, irreversible environmental impacts and a depletion of our natural resources.[152] Monsanto, too, has done great things with its technology, including finding ways to feed a growing population. This technology, however, has been at the expense of other members of the earth community. It took approximately 200 years to begin to understand the impacts of the Industrial Revolution,[153] but just fifteen years after introduction of the Roundup® ready soybeans, the evidence of its effects are already evident.[154] If Monsanto continues to operate as a conqueror of other members of the earth community, self-defeat is inevitable. The discovery of superbugs and superweeds is already evidence that Monsanto may not be able to call nature's bluff as well as it anticipated.[155]

On the spectrum of ethical theories applicable to human's relationships with objects of nature lies egocentrism, anthropocentrism, biocentrism, and ecocentrism. Egocentrism and anthropocentrism are more human centered, whereas biocentrism and ecocentrism are more holistic. Egocentrism reflects the idea that the human self or individual is the center of all things.[156] Anthropocentrism describes the idea that only human beings possess value, and that the value of other things is defined by their usefulness and importance to humans. Biocentrism extends inherent values to all living things, including plants and animals, and requires a level of respect for all organisms. Finally, ecocentrism is a holistic approach that asserts duties are owed to the ecosystem as a whole, and each organism's value will depend on its role in the larger community.[157] An example of ecocentrism would be Aldo

151. *Id.* at 52 ("Bit by bit we feed Earth into the mill of human greed, sacrificing all in the name of the insatiable gods of 'progress' and 'development.'"). As discussed above, Monsanto scientists were the first individuals to genetically modify a plant cell. *See* MONSANTO, *supra* note 14. Genetically Modified Organism is defined as "[a] term that refers to plants that have had genes implanted to improve their performance by making them resistant to certain pesticides, diseases, or insects." *See Crop Glossary*, *supra* note 12. Genetic engineering is a manipulation of the soybean's life cycle for the purpose of increasing yields. A soybean's natural life cycle within its community is intercepted when generic engineering alters the soybean's normal development. *Id.*

152. Eric McLamb, *The Ecological Impact of the Industrial Revolution*, ECOLOGY GLOBAL NETWORK (Sept. 18, 2011), http://www.ecology.com/2011/09/18/ecological-impact-industrial-revolution/.

153. *Id.*

154. Killman, *supra* note 41.

155. *Id.*

156. *Egocentrism*, DICTIONARY.COM, http://dictionary.reference.com/browse/egocentrism (last visited Apr. 15, 2015).

157. DERR & MCNAMARA, *supra* note 29, at xiii-xxi.

Leopold's Community Theory, whereas Monsanto's control of stakeholders in the soybean industry could be classified as egocentrism.

The soybean's interest, taken alone without considering its fundamental role in the earth community, would be best represented and protected through an adoption of a biocentric ethical point of view. Some of the key components of this point of view include placing equal value and granting equal rights to all organisms, understanding that each organism has a place in the grand scheme of things, and that humans should care about and respect an organism for the organism's own sake, not just for the reason that the organism's well-being will benefit humans.[158] Biocentrism would mean soybeans would be put on equal footing with regards to rights and its value to humans. Further, it would be respected for being a soybean instead of for being a valuable food source for humans.

If, in the alternative, an anthropocentric ethical point of view was adopted, humans would have the ethical leeway to exploit soybeans to the extent such efforts would not negatively impact humans themselves. Under this point of view, human life is considered different from and more valuable than other organisms, and the value of other organisms is determined by the benefits they offer humans. A soybean under this view would have some protections; for instance, they would probably never go extinct because this would not be beneficial to human interest. However, humans can exploit the soybean in any manner they see fit so long as it does not reduce the soybean's value as measured by human interest. While some interested parties would argue genetic engineering reduces a soybean's value for human use due to the possibility of long-term detrimental effects on human health and the environment, it appears, given the prevalence of the genetically engineered version, for most, the value of the genetically engineered soybean has the same value as a soybean in its natural form. In fact, many humans would probably argue that they have improved the soybean under their duty to "intervene in nature to make life better for humanity."[159] Assuming, arguendo, humans have not caused any harm to their ability to use soybeans, and may have even improved their ability to use soybeans, all the exploitation suffered by the soybean would be considered ethical.

It is easy to see the deficiencies in each of these arguments. Under the latter, the soybean's interest is not considered, and humans can do whatever is necessary to ensure the soybeans continue to be a

158. JAMES B. MARTIN-SCHRAMM & ROBERT L. STIVERS, CHRISTIAN ENVIRONMENTAL ETHICS: A CASE METHOD APPROACH 311-15 (2003).

159. *Id.*

valuable resource. Under the former, soybeans would be valued for being soybeans instead of being a food source for humans. Neither of these views would adequately respect the soybean's fundamental role in the earth community, which includes being a food source for humans. In one respect, humans could have free rein to act to their detriment in exploiting the soybean to the point it can no longer be a food source for humans. On the other hand, soybean's rights or value can never adequately be protected because humans, which are an essential component to the soybean's individual value, are not considered.

The interest of soybeans would be best served if humans adopted an ecocentric ethical point of view, similar to Aldo Leopold's Community Theory. Under this view, the soybean's value would be measured, and consequently protected, according to its role in the community. Given its role as a food source for humans, the soybean would be valued and protected to ensure its ability to produce food is not hindered.

The soybean is a stakeholder in the soybean industry; as members of the earth community, soybeans have rights and values that need to be acknowledged. Expressed constantly through this article, the soybean's fundamental role in the earth community is to provide food and resources for humans. Given the soybeans' heavy reliance on humans to complete their role, we must now turn to the human stakeholders in the soybean industry.

B. Competing Human Interests

Humans' role as a consumer of soybeans in the soybean-human relationship has resulted in a massive soybean industry that splits human stakeholders into three distinct interest groups: the corporate seed companies, specifically Monsanto; the farmers who harvest the seeds for consumption; and the consumers who ultimately fulfill the human role in the soybean-human relationship by using soybeans and soybean products to fulfill their nutritional and resource needs. The following will review the interest of these three groups and how their interests would be affected if soybean rights were acknowledged and incorporated into the legal structure of the soybean industry.

1. Corporate Seed Companies

The global seed market is dominated by a limited group of powerful, vertically integrated corporations. Chemical companies have

acquired seed companies through various mergers and acquisitions allowing dominance of the industry.[160] These companies are now the main providers for agricultural goods, including agricultural chemicals, seeds, and biotechnology traits.[161] As of 2010, Monsanto had a market value of $44 billion.[162] In the same year, its net sales were over $10 billion, over $7 billion of which was from its seed and genomics.[163] Many have challenged Monsanto's aggressive business practices, which use various patenting and licensing techniques to protect its products, as having monopolistic effects on the seed market and bordering on anti-competitive practices.[164] However, Monsanto, as a publicly traded company, does have a duty to maximize profit for its shareholders. "The canonical law and economics view holds that corporate managers do and should have a duty to profit-maximize because such conduct is socially efficient given that general legal sanctions do or can redress any harm that corporate or non-corporate businesses inflict on others."[165]

If the rights of the soybean were considered in the adoption of governing law applicable to the soybean industry, many of Monsanto's business practices could be affected. For example, if Monsanto could no longer patent its seeds, the restrictions on the seed-saving practices (found to clearly violate fundamental rights of the soybean) may no longer be enforceable. If Monsanto could no longer enforce seed-saving restrictions, farmers would be able to plant seeds from a present crop yield in a subsequent season, reducing the amount of seeds that must be purchased from Monsanto each year. Consequently, Monsanto would lose profits from its seed sales. Acknowledging soybean rights could detrimentally affect Monsanto's business practices and ulti-

160. Cowan, *supra* note 21.

161. *Id.*

162. Robert Langreth & Mathew Herper, *The Planet Versus Monsanto*, FORBES (Dec. 31, 2009), http://www.forbes.com/forbes/2010/0118/americas-best-company-10-gmos-dupont-planet-versus-monsanto.html.

163. *Faces of Farming: 2010 Annual Report*, MONSANTO, http://www.monsanto.com/investors/documents/pubs/2010/annual_report.pdf (last visited Apr. 15, 2015) (explaining how net income also includes sales of Roundup and other herbicide resistant products, which went down in 2010, due primarily to generic competition in the U.S.).

164. The Antitrust Division of the U.S. Department of Justice uses the Herfindahl-Hirchman Index to measure the size of firms relative to the overall industry as an indicator of the degree of competition among such firms. Based on this measurement, the global seed industry does appear to be competitive. However, this measurement fails to account for concentrations in particular seed categories. *See* Cowan, *supra* note 21.

165. Einer Elhauge, *Sacrificing Corporate Profits in the Public Interest*, 80 N.Y.U. L. REV. 101, 101 (2005).

mately affect its interests in the soybean industry, which is to generate maximum profitability for shareholders.

2. Farmers

As of 2007, there were 279,110 farms raising soybeans in the U.S.[166] Soybean crops extend over 77 million acres.[167] In 2013, soybean crops valued over $42 billion.[168] Throughout U.S. history, farmers have played, and continue to play, a central role in the soybean industry. Without the farmer, corporate and consumer needs would not be met. A farmer's individual interest in the industry includes the ability to cultivate his or her land and ultimately harvest adequate crop yields, which can be admitted into the market for profit. In other words, a farmer's livelihood is supported by this industry.

If the rights of the soybean were considered in the adoption of governing law applicable to the soybean industry, the farmer's interest would be more adequately accounted for in the process. For example, if Monsanto could no longer patent seeds, farmers would no longer be forced to cooperate with Monsanto. Farmers would have the ability to work with the seeds that provide the best results and support the overall health of their farms, instead of making key decisions under the cloud of patent and licensing obligations imposed by Monsanto. Further, the ability to save seed would place U.S. farmers in a better position to compete in the global seed market.

Currently, Brazil and Argentina are the top soybean producers, behind the U.S.[169] However, due to patenting and enforcement complications in these countries, Monsanto is unable to exercise the same market control in these countries that Monsanto enjoys in the U.S.[170] Specifically, farmers in Brazil and Argentina are exempt from certain technology fees and are sometimes able to avoid seed saving restrictions.[171] These advantages allow Brazilian and Argentinean farmers to be stronger competitors in the global seed market to the disadvantage

166. *Soybean and Oil Crops Background*, USDA ECON. RES. SERV., http://www.ers.usda.gov/topics/crops/soybeans-oil-crops/background.aspx (last updated Oct. 10, 2012).

167. *Id.*

168. *Value: Soybean Value History*, SOYSTATS, http://soystats.com/value-history/ (last visited Apr. 15, 2015).

169. *International World Soybean Production*, SOYSTATS, http://soystats.com/international-world-soybean-production/ (last visited Apr. 15, 2015).

170. Randy Schnepf, *Genetically Engineered Soybeans: Acceptance and Intellectual Property Rights Issues in South America*, CONG. RES. SERV. REPORTS (Oct.17, 2003), http://nationalaglaw0center.org/wp-content/uploads/assets/crs/RS21558.pdf.

171. *Id.*

of U.S. farmers.[172] Should patent restrictions be lifted in light of the soybean's interest, the farmer's interest would also be better protected in that they would be free to harvest soybeans in a manner that allows them to compete in the global market, produce adequate crop yields that meet consumer needs, and protect the health and maintenance of their farms.

3. Consumers

The consumer is a key stakeholder in the soybean industry and is the stakeholder who fulfills the human role of the soybean-human relationship by consuming the fruits of the soybean's efforts. Given the widespread consumption of processed foods by the average U.S. citizen and the prevalence of soybeans in these processed products, the consumer's interest in the soybean industry revolves around the need to have adequate and quality soybean stocks readily available. As a general matter, consumers also have the right to make informed decisions about the food they eat.[173] Consequently, consumers cannot fulfill their role in the soybean-human relationship unless there are (1) soybeans to consume and (2) composition transparency.

If the rights of the soybean were considered in the adoption of governing law applicable to the soybean industry, soybeans would be protected in such a manner to ensure that they can produce crop yields year after year to meet human consumption needs. Monsanto could argue requiring farmers to use patented soybeans under strict guidelines allows the industry to meet human consumption needs. However, in the long term, respecting soybean rights by restricting the ability to patent seeds and allowing seed saving may be a more dependable option. These changes would shift the control of crops to persons in the best position to judge how to reach the crop yields required by industry demands—the farmers in the fields. The farmers are in the best position to judge which seeds to use year after year and which cultivating techniques keep their acreage in top health. With the farmers in control, consumers could rest knowing their soybean demands will be met.

"U.S. Citizens have been deprived of their autonomy and freedom of choice, just as farmers have been deprived of their independent livelihoods and the plants have been deprived of their essence. Individuals have the fundamental right to know what they are buying and

172. *Id.*

173. Debra M. Strauss, *Defying Nature: The Ethical Implications of Genetically Modified Plants*, 3 J. FOOD L. & POL'Y 1, 25-28 (2007).

eating . . . ."[174] There are various ethical and health concerns associated with the consumption of GE crops and GE foods, making composition transparency an important right of consumers. Proponents of the implementation of mandatory labeling requirements for GE products advocate the adoption of "right to know" policies that allow consumers to make food choices on their own values.[175] Currently, mandatory labeling of GE products is not required by the FDA, and while states are actively developing GE labeling laws, the success of these laws are still unknown. If soybean rights were acknowledged in industry regulations, proponents of labeling requirements at the state and federal level would have a new argument to pursue. In acknowledging the soybeans' rights, consumers' rights must also be acknowledged, as soybeans' rights are hindered when humans are not able to fulfill their role as a consumer. Consequently, the rights of humans to composition transparency may be recognized in order to avoid burdening soybean interests.

The governing law of the soybean industry provides many protections for large corporations and minimal protections for farmers and consumers. If soybean rights were acknowledged by governing agencies and U.S. courts, Monsanto's interest in maximizing profit would be negatively affected. On the other hand, farmers and consumers would benefit as soybean rights are based on the soybean-human relationship, which is best served when the interest of all parties are considered. In sum, if the missing soybean is recognized, the interests of all stakeholders will result in a balanced aggregate.

IV. Recommendations for Reform

The only question left, then, is how to acknowledge soybean rights and incorporate their interest into the governing law and regulations of the soybean industry. Many potential options have been brushed upon throughout the discussions of Part III; however, practically speaking, all of these measures cannot be implemented immediately, nor is it likely these options would be readily accepted at first introduction. For these reasons, it is suggested the following changes be implemented to start. Taken in order, the evolution of soybean rights will begin in a manner that can be easily digested and steadily evolve until the interests of all stakeholders are balanced.

174. *Id.* at 25-26.

175. Vogt & Parish, *supra* note 11.

A. Increase Farmer and Consumer Protection

The presently ignored interests of consumers and small farmers can be used as a medium to reform governing law in a manner that is more consistent with the soybean's interest. The current governing laws described herein have an anthropocentric foundation, which treats other species as resources for human consumption, considered only in how they serve human interests.[176] To account for soybean interests, all of the laws applicable to the industry would have to undergo a complete overhaul in order to support such a concept. Given this is such a daunting project, coupled with the fact anthropocentric attitudes would be required to create such a foundation, it is not likely that soybean interests, standing alone, would have the clout necessary to provoke action.

Alternatively, pushing for stricter labeling laws or narrowing patent protections would protect consumers and small farmers in such a manner that they would be able to support soybean interests in their own practices. For example, if patent laws were narrowed to allow the practice of seed saving, small farmers would benefit from the practice and soybeans would be able to go through their complete and natural life cycle. Further, as soybeans provide sustenance and serve as a resource to humans, improved labeling laws will provide consumers with opportunities to control their utilization of soybeans through composition transparency. If soybean use diminishes as a result of GE labeling, the effect may be the gradual shift from the use of GE soybeans to non-GE soybeans due to market demands. Shifting away from GE soybeans would benefit the consumers who demanded such change, but it would also benefit the soybean itself as it would have the opportunity to adequately fulfill its role in the earth community as a resource for humans. Given the activity states are now taking to enact labeling laws at the state level, a step towards reducing GE soybean use has already commenced. Recognition of consumer rights is also evident in recent litigation, whereby plaintiffs seek to challenge industry's failure to warn consumers regarding GE ingredients under false advertising laws.[177]

176. *See* SCHRAMM & STIVERS, *supra* note 158, at 17-18.

177. *See* Alut v. J.M. Smucker Co., 2014 WL 1998235 (S.D. NY 2014); *see also* In Re Frito-Lay North American, Inc. All Natural Litigation, 2013 WL 4647512 (E.D.N.Y. 2013).

B. *Relax Standing Requirements*

Next, standing requirements should be relaxed to allow interested parties to bring actions on behalf of soybeans. U.S. courts also tend to exercise anthropocentric reasoning in their judicial decision making. Consequently, a court may not be inclined to find standing for a soybean bringing an action on its own behalf or as an inanimate object that represents nonhuman interests. However, courts may find standing in an interest group or a "friend of the soybean" under the guardianship theory described herein. These groups are often in the best place to make arguments on behalf of the soybean, as they know the issues inside and out and have an interest at stake. A court will recognize that this arrangement serves human interests, as these groups have an interest in the outcome and typically care about the cause.

Another way in which soybeans could develop recognizable interests in court would be to name the soybean as a plaintiff under an action.[178] While species have been denied individual standing under the citizen suit provision of the Endangered Species Act, some courts have suggested the species should be able to have standing as "any other entity."[179] For example, in *Palila* v. *Hawaii Department of Land and Natural Resources*, the U.S. Court of Appeals for the Ninth Circuit explained regarding Palila, an endangered species and named plaintiff in the case, that "the bird. . . has legal status and wings its way into federal court as a plaintiff in its own right."[180] If animals can be named in lawsuits along with human interests (or other inanimate entities capable of filing lawsuits), soybeans may be able to be plaintiffs, as well.

C. *Paradigm Shift*

Finally, society should begin moving toward an adoption of an ecocentric ethical perspective. Again, ecocentrism is a holistic approach asserting the idea that duties are owed to the ecosystem as a whole and that each organism's value will depend on its role in the larger community.[181] While a far step away from the anthropocentric mentalities of

178. Wymyslo, *supra* note 135, at 58.

179. *Id.* at 54.

180. 852 F.2d 1106, 1107 (1998). The Ninth Circuit failed to follow this reasoning six years later in *Cetacean Community v. Bush*, 386 F.3d 1169 (2004), when it decided the language in *Palila* was mere dicta. *See* Wymyslo, *supra* note 135, at 56.

181. DERR & MCNAMARA, *supra* note 29, at xiii-xxi.

today, ecocentrism is a perspective that can be introduced in a manner that will be easily accepted by human-centered societies. Under ecocentrism, each human would have a valuable role in the earth community. As humans have the knowledge and power to make substantial impacts to the earth community (minimally evidenced herein), their duties owed to the ecosystem should include the duty to harbor the ecosystem's components and be held accountable for their actions. While no advocate could win over its audience by announcing to it their obligation to accept responsibility for the negative consequences of their conduct, an advocate of ecocentrism could be successful in pushing a paradigm shift by proposing that humans voluntarily take on the roles of conservationists or preservationists. While these roles have fundamental differences in the level of respect provided to nature, both acknowledge the need for healthy ecosystems and human cooperation with nature.[182] Humans may be willing to take on these roles because, ultimately, conservation and preservation will directly benefit their own interests and because humans maintain control over their actions. Once in these roles, humans may recognize their duties to the ecosystem. This recognition will eventually lead humans to find their mistakes and seek the change required by their position.

CONCLUSION

> By and large, our present problem is one of attitudes and implements. We are remodeling the Alhambra with a steam-shovel, and we are proud of our yardage. We shall hardly relinquish the shovel, which after all has many good points, but we are in need of gentler and more objective criteria for its successful use.[183]

Technology has provided great progress in agricultural areas that have allowed the mass production of staple crops, like the soybean. Genetic engineering, though controversial for many reasons, is a scientific accomplishment that should not be renounced. This type of innovation may be the answer to our growing population, but these technologies should not be implemented at the expense of other stakeholders in the industry or to the earth community itself. To provide adequate protection and meet maximum sustainability for all interested parties, it is essential that governing law controlling the soybean industry considers the soybean as a stakeholder. To begin this recognition, the interest of all stakeholders, including corporations, farmers, consumers, the

182. SCHRAMM & STIVERS, *supra* note 158, at 25-28.

183. LEOPOLD, *supra* note 124, at 7.

earth community, and the soybean, must be balanced. Next, soybean interests should be recognizable and justiciable. Finally, the earth community must begin to shift away from an anthropocentric ethical perspective to an ecocentric perspective. Aldo Leopold explains that "a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."[184] While we are not sure what a balanced soybean industry will look like, we can be assured that these steps will place us in the direction to ultimately meet the "right" result.

184. *Id.*

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